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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/684,184	10/09/2003	Akihiro Maezawa	KOY-0014	2625

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EXAMINER
ROSENBERGER, FREDERICK F

ART UNIT	PAPER NUMBER
2878	

DATE MAILED: 04/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	**Application No.** 10/684,184	**Applicant(s)** MAEZAWA ET AL.	
	Examiner Frederick F. Rosenberger	**Art Unit** 2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4,5,8,11,14,17 and 18* is/are rejected.

7)☒ Claim(s) *2,3,6,7,10,12,13,15,16,19 and 20* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date *5/3/04*.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

3. The disclosure is objected to because of the following informalities:

   a. Page 5, line 18: “anneling” should be “annealing”.

   b. Page 7, line 9: “radiographic image conversion image panel” should be “radiographic image conversion panel”.

   c. Page 7, line 15: The recitation of 90μm for the crystallite size is in disagreement with recitations for the crystallite size elsewhere in the specifications (i.e. page 8, line 12: 90 nm).

   d. Page 8, line 3: The recitation of 650 to 450nm for the wavelength range is in disagreement with recitations for the wavelength range elsewhere in the specifications (i.e. page 7, line 6: 350 to 450nm).

e. Page 9, line 15: X_1" is not found in equation 2.

f. Page 17, line 14: The materials listed for M^{13} is slightly different from those listed on page 9, line 14.

g. Page 23, line 18: "co deposite" should be "codeposit".

h. Page 26, lines 1-2: The recitation of 100μm - 500μm for the preferable range of the film thickness is unclear as it is not a subset of the prior stated range of 50-300μm (page 26, line 1).

i. Page 31, line 19: "mat" should be "matte".

j. Page 37, line 21: "Furhther" should be "Further".

k. Page 41, line 15 and page 50, line 2: "μmϕ" should be "μm".

Appropriate correction is required.

Claim Objections

4. Claims 3, 6, 10, and 13 are objected to because of the following informalities: In each of the claims mentioned, the second paragraph of the claim, line 7, refers to X_1" in the formula (2) of the claim. However, there is no X_1" in the formula (2) or defined in the specifications. Since X_1, X_1', and X_1" are all halogens from the group F, Cl, Br, and I, it has been assumed for the purposes of this Office action that X_1" refers to $X_1'_3$ as shown in formula (2) of the claim.

Appropriate correction is required.

5. Claims 1, 4, 8, and 11 are objected as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With regards to claims 1 and 8, applicant specifies two different wavelength ranges within which the two luminescence wavelength peaks should be located. In claim 1, the peaks should be between 350nm and 450nm (with antecedent basis on page 7, line 6 of the specifications. In claim 8, the peaks should be between 650nm and 450nm (with antecedent basis on page 8, line 3 of the specifications). Applicant never makes a distinction between the two different wavelength ranges. The omission of the second wavelength range from the abstract lends credibility to the assumption that the second wavelength range is a typographical error. For the purposes of this Office action, the wavelength range, as recited in claim 8, has been interpreted to be 350nm to 450nm.

With regards to claims 4 and 11, applicant specifies two different sizes for the crystallite size of the phosphor. In claim 4, applicant specifies a crystallite size of 90μm (with antecedent basis on page 7, line 15 of the specifications). In claim 11, applicant specifies a crystallite size of 90nm (with antecedent basis on page 8, line 12 of the specifications). Applicant never makes a distinction between these two crystallite sizes. The fact that the 90μm crystallite size would easily exceed the minimum thickness as specified in dependent claim 5 lends credibility to the assumption that the 90μm crystallite size is a typographical error. For the purposes of this Office action, the crystallite size, as recited in claim 4, has been interpreted to be 90nm.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1, 4, and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Bollen et al. (GB Patent # 1,477,639).

Bollen et al. describe a photostimulable phosphor capable of being used in a radiographic image conversion panel comprising a support (page 4, lines 40-43) with a photostimulable phosphor layer provided on the support with a layer thickness of 50μm to 500μm (page 4, lines 56-61) and with two luminescent peaks between 350nm and 450nm (Figure 1). Bollen et al. further disclose that the preferred grain size, or crystallite size, of the phosphor particles is 1-25μm.

8. Claim 11 is rejected under 35 U.S.C. 102(e) as being anticipated by Iwabuchi et al. (US Patent # 6,870,167).

Iwabuchi et al. describe a method for manufacturing a radiographic image conversion panel having at least one photostimulable phosphor layer, comprising forming the layer according to a vapor phase growth (column 4, lines 42-45) so that a film thickness of the layer becomes not less than 50μm (column 7, lines 29-30) and that a crystallite size of a photostimulable phosphor in the layer becomes not less than 90nm (column 7, lines 59-62).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 8, 14, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bollen et al. in view of Iwabuchi et al.

Bollen et al. describe a method for manufacturing a radiographic image conversion panel with a photostimulable layer with a thickness of 50μm to 500μm (page 4, lines 56-61) on a support and with two luminescent peaks between 350nm and 450nm (Figure 1). Bollen et al. further disclose that the preferred grain size, or crystallite size, of the phosphor particles is 1-25μm.

However, Bollen et al. are silent with regards to the vapor phase growth method for forming the photostimulable phosphor layer.

Iwabuchi et al. teach that it is known in the construction of radiation image storage panels to use a vapor deposition process for the formation of the stimulable phosphor layer for increasing sensitivity and sharpness of the panel (column 1, lines 46-51).

Thus, it would have been obvious for a person having ordinary skill in the art to modify Bollen et al. such that the phosphor layer is deposited via a vapor phase growth method to increase the sensitivity and sharpness of the resulting image conversion panel, as taught by Iwabuchi et al.

Allowable Subject Matter

11. Claims 2, 3, 6, 7, 9, 10, 12, 13, 15, 16, 19, and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. The following is a statement of reasons for the indication of allowable subject matter:

Claims 2, 7, 9, and 12 are directed towards a stimulable phosphor which satisfies the formula $M^1X \bullet aM^2X'_2:eA$, A" where the M^1 is at least one kind of alkali metal selected from the group of Li, Na, K, Rb, and Cs; the M^2 is at least one kind of bivalent metal atom selected from the group consisting of Be, Mg, Ca, Sr, Ba, Zn, Cd, Cu, and Ni; the X and X' are each one kind of halogen selected from the group consisting of F, Cl, Br, and I; the A and A" are each rare-earth elements selected from the group consisting of Eu, Tb, In, Ce, Tm, Dy, Pr, Ho, Nd, Yb, Er, Gd, Lu, Sm, and Y; and each of the a and the e represents a numeric value in a range of $0 \leq a < 0.5$ and $0 < e \leq 0.2$. The prior art neither discloses nor teaches a stimulable phosphor according to the formula. Although prior art can be found for components of the formula, the inclusion of M^1 and M^2 with the separate A" component appears to be unique to applicant's disclosure. As such, applicant's disclosure provides a novel and nonobvious improvement over the prior art. Accordingly, the claims 2, 7, 9, and 12 have allowable subject matter. Claims 15 and 20 would be allowable by virtue of their dependence on claims 2 and 7.

Claims 3, 6, 10, and 13 are directed towards a stimulable phosphor which satisfies the formula $M^{11}X_1 \bullet bM^{12}X_1'_2 \bullet cM^{13}X_1'_3:fA_1$, where M^{11} and M^{12} are different alkali metals selected from the group consisting of Li, Na, K, Rb, and Cs; M^{13} is at least one kind of tervalent metal atom selected from the group consisting of Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu; the X_1 and X_1' are at least one kind of halogen selected from the group consisting of F, Cl, Br, and I; and the A_1 is at least one kind of rare-earth element selected from the group consisting of Eu, Tb, In, Cs, Ce, Tm, Dy, Pr, Ho, Nd, Yb, Er, Gd, Lu, Sm, and Y; and each of the b, c, and f represent numeric values in the range of $0 \leq b < 0.5$, $0 \leq c < 0.5$, and $0 < f \leq 0.2$. The prior art neither discloses nor teaches a stimulable phosphor according to this formula. Although prior art can be found with similar formulas, the requirement that M^{11} and M_{12} both be different alkali metals rather than one alkali metal and one alkaline earth metal (see Iwabuchi et al., column 4, formula (I)) appears to be unique to applicant's disclosure.

As such, applicant's disclosure provides a novel and nonobvious improvement over the prior art. Accordingly, the claims 3, 6, 10, and 13 have allowable subject matter. Claims 16 and 19 would be allowable by virtue of their dependence on claims 3 and 6.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Nakamura (US Patent # 4,835,398) discloses a stimulable phosphor that exhibits two luminescent peaks between 350 and 450nm as shown in Figure 1, curve 2.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frederick F. Rosenberger whose telephone number is 571-272-6107. The examiner can normally be reached on Monday-Friday 7:30 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on 571-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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